

(12) UK Patent Application (19) GB (11) 2 261 404 (13) A

(43) Date of A publication 19.05.1993

(21) Application No 9221146.5

(22) Date of filing 08.10.1992

(30) Priority data

(31) 4133730
4205773

(32) 08.10.1991
21.02.1992

(33) DE

(71) Applicant

Mannesmann AG

(Incorporated in the Federal Republic of Germany)

Mannesmannuferstrasse 2, W-4000 Dusseldorf 1,
Federal Republic of Germany

(72) Inventors

**Werner Mäde
Dieter Stellmach**

(74) Agent and/or Address for Service

**Lloyd Wise, Tregear & Co
Norman House, 105-109 Strand, London, WC2R 0AE,
United Kingdom**

(51) INT CL⁵

B41J 13/03 // B41J 11/48 29/02

(52) UK CL (Edition L)

B6F FAH FAL FKE FNC F263 F522

(56) Documents cited

None

(58) Field of search

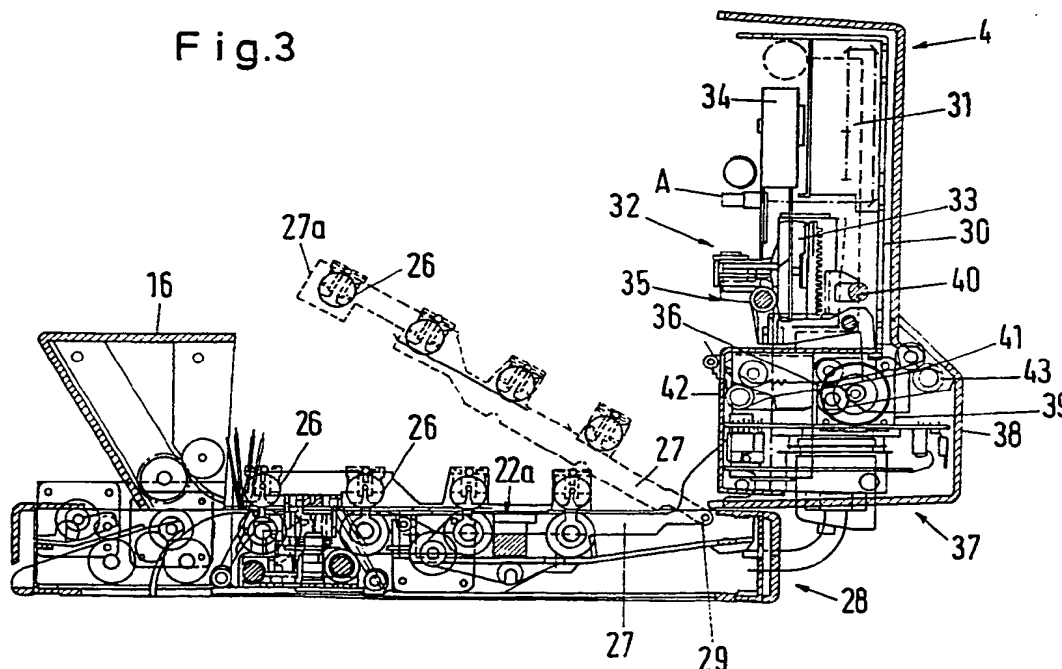
UK CL (Edition L) B6F FAB FAL FKD FKE FKJ FKK
FKL FKP FKQ FKS FKW FNC
INT CL⁵ B41J 13/00 13/02 13/03 13/076 29/02

(54) Allowing access to the paper feed path in selective printers

(57) A printer having a framework within a housing and an assembly secured to same is described. The assembly includes paper input and output channels formed by pairs of rollers (26) at least a printing station (32) comprising respectively a printing head, a printing support and an ink ribbon cassette and, preferably, other processing stations, such as for example a magnetic strip identification device and a paper cutting device. The housing is arranged in the form of a lower base section and an upper housing section (4) which can be moved relative the base section and thereby opened for access to the interior of the machine. With the housing opened, at least one roller associated with a lower roller positioned in the base section is capable of being raised independently of the housing movement for the release of material to be printed upon.

As described, the machine is capable of accepting substrates from a plurality of sources. The upper feedrolls are mounted on a carrier (27) which is independently pivoted (29) to the base.

Fig.3



GB 2 261 404 A

1/4

Fig.1

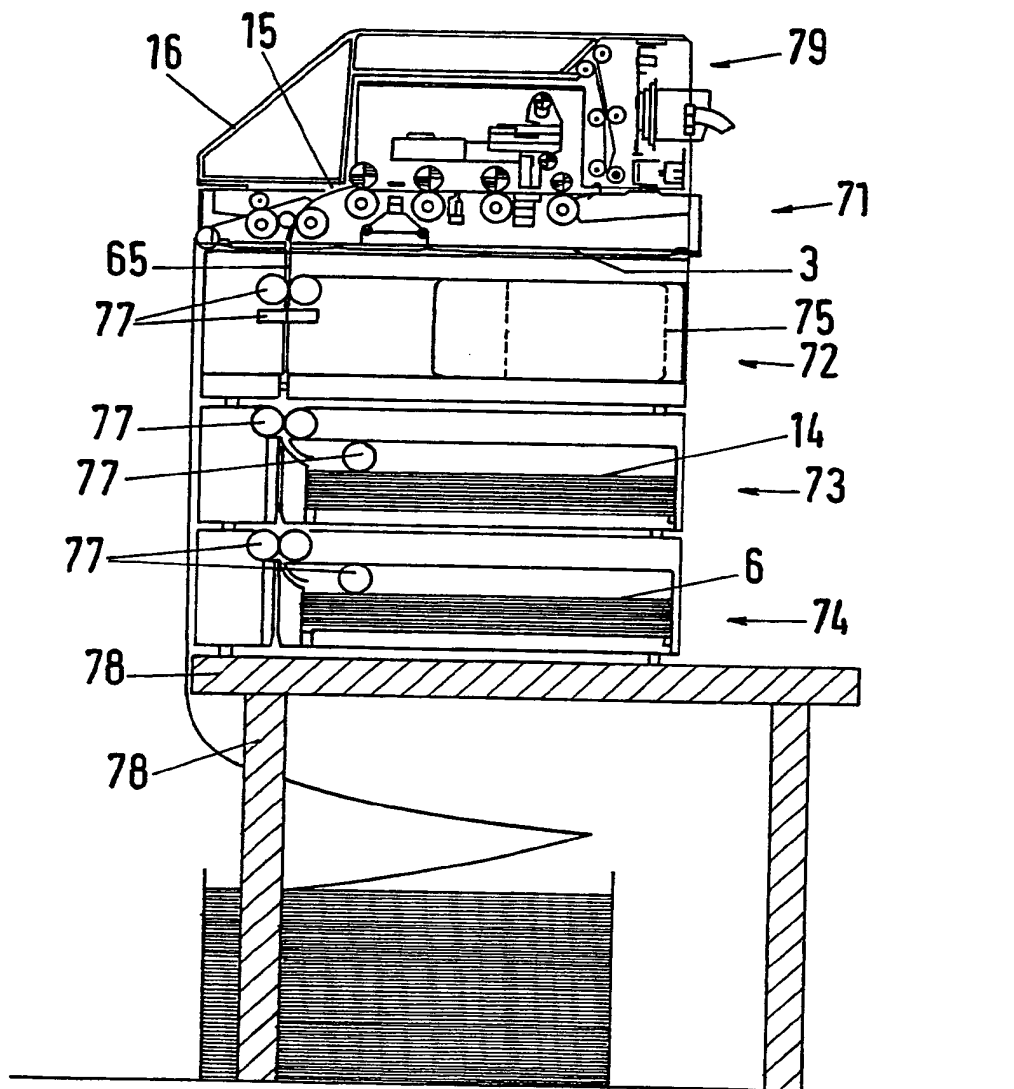
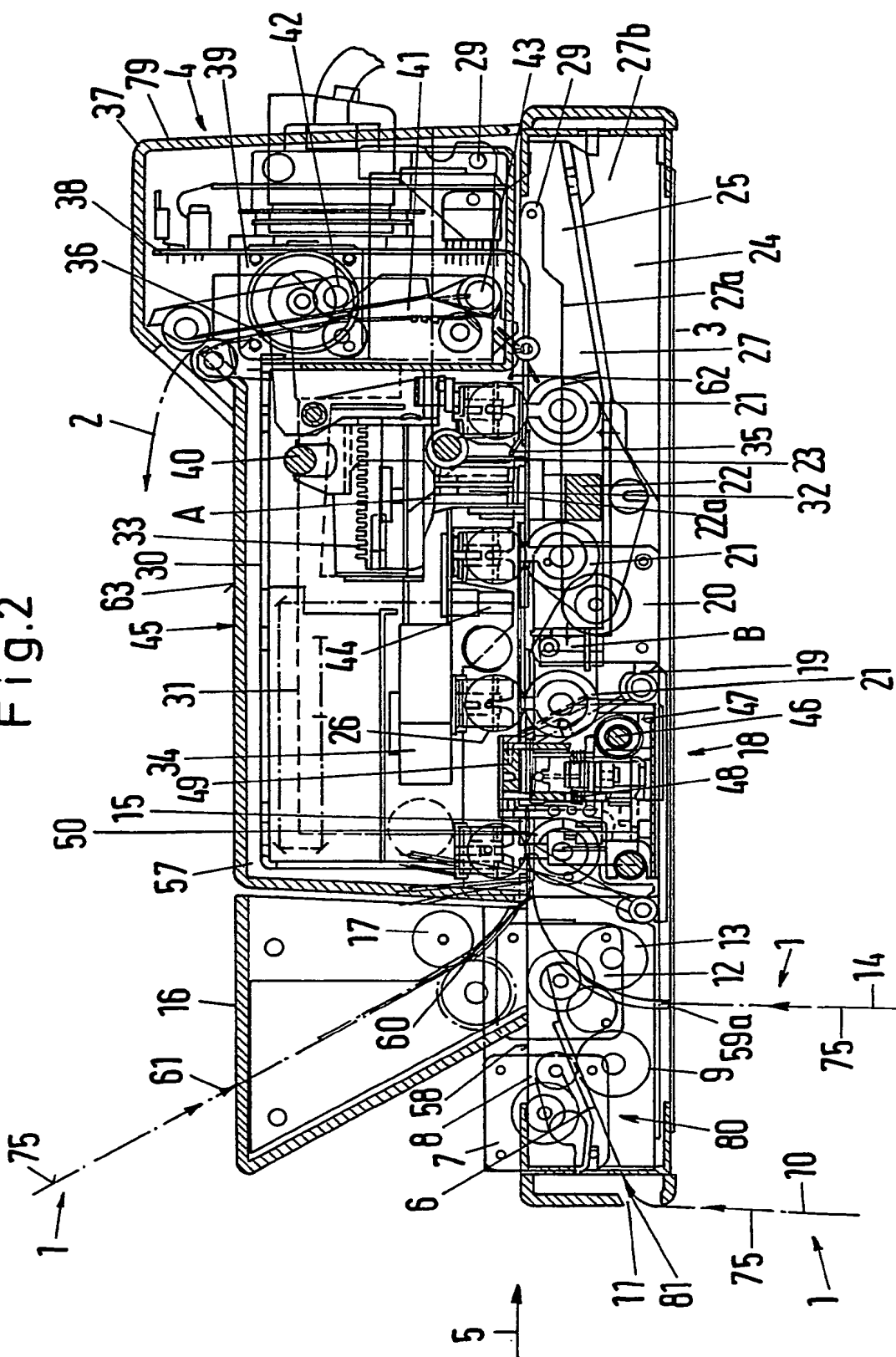


Fig.2



3/4

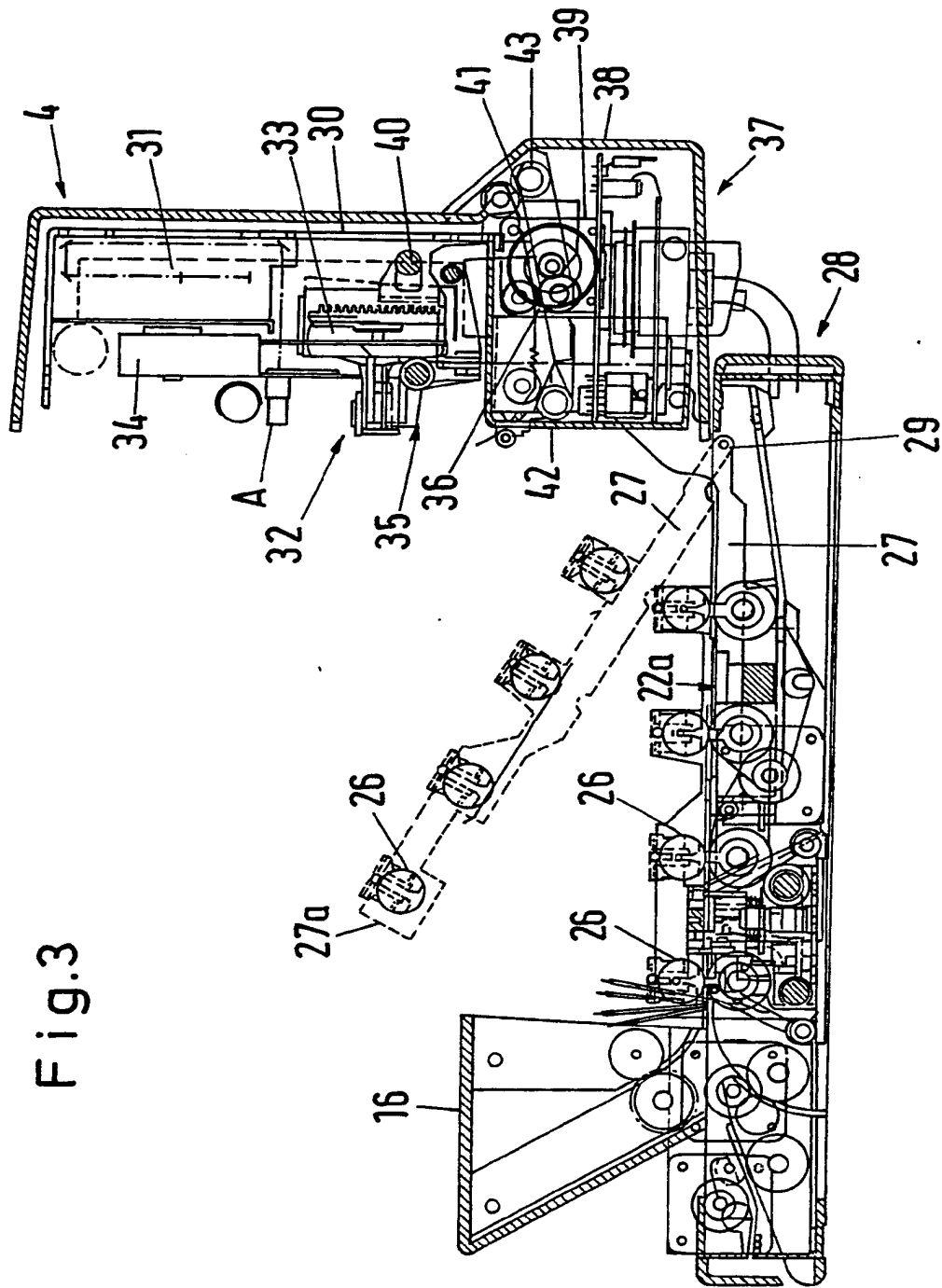
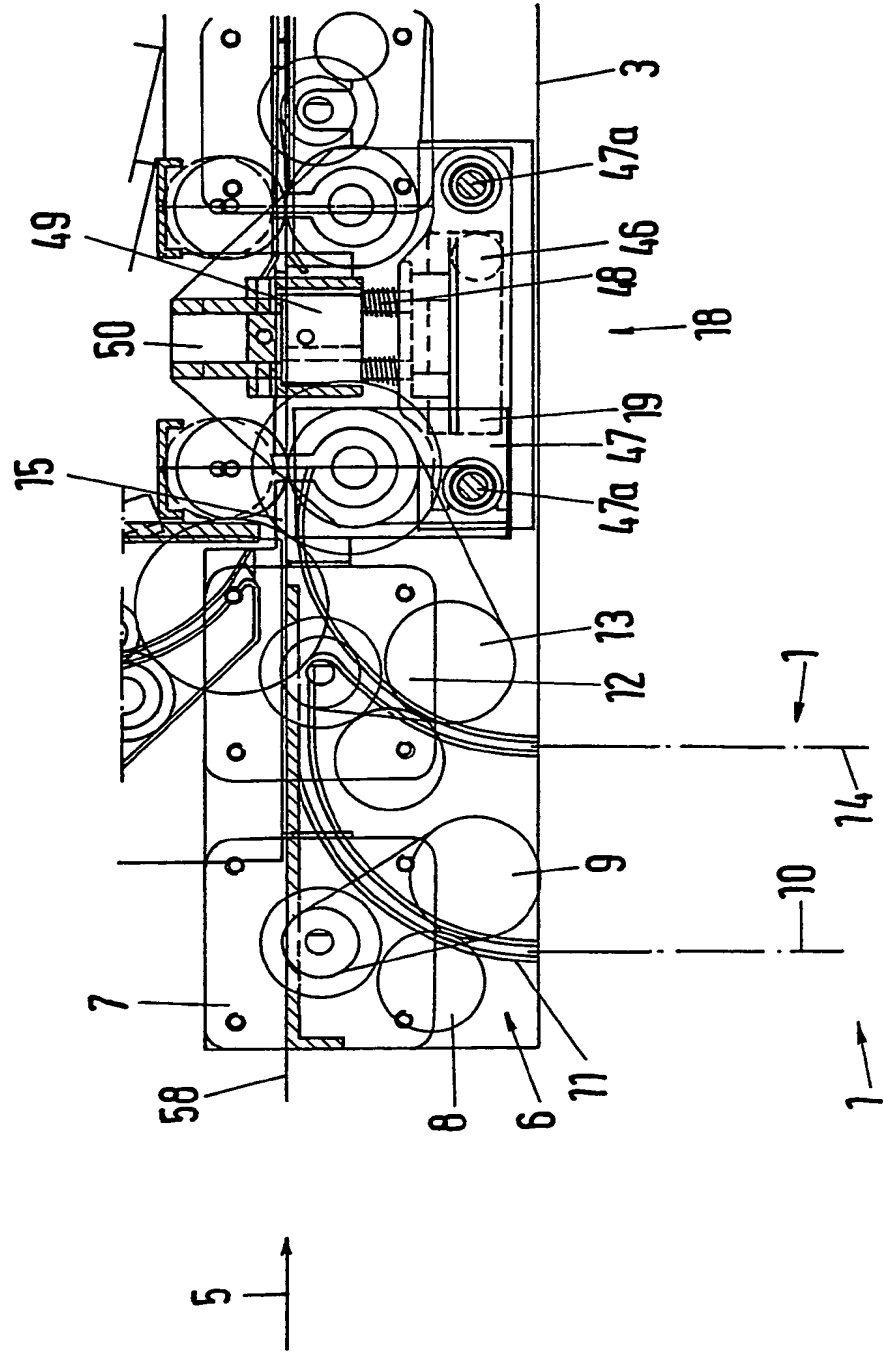


Fig.3

4/4

Fig.4



A PRINTER

This invention relates to a printer, in particular to a printer for use with both continuous and sheet material such as may be employed in the preparation, for example, of travel documents.

Modular printing devices are known. One such printer comprises a framework on which the necessary guideways are constructed as paper input and output channels by means of rollers and assemblies, for example, a printing station having a printing head and a printing support are provided. An ink ribbon cassette is generally further provided. Further assemblies include a magnetic strip identification device and a paper cutting device. It is customary to have a releasable continuous material carrier or a releasable printing mechanism. A releasable continuous material carrier is used to allow easy handling and servicing accessibility. The printing mechanism together with the continuous material carrier is constructed to open out (unfold). A single sheet carrier is constructed as a removable base. Thus the known printer has separate paper paths for individual sheets in the base and for continuous sheets in the movable, opening out, part. Furthermore, when separation of the individual sheet path and continuous sheet path is not necessary or not required the known arrangement cannot be used.

A printer in accordance with the invention comprises an assembly arranged within a housing on a framework which comprises paper input and output channels formed by pairs of rollers and one or more processing stations including at least a printing station, the housing comprising a base section and an upper housing section moveable relative the base section to open out the housing wherein the upper housing section and an at least one upper roller associated with a lower roller positioned in the base section are capable of being independently raised.

This arrangement allows for the release of material to be printed. The printer is particularly suited for printing a plurality of types of documents, for example,

single tickets, public transport tickets, travel invoices, travellers cheques with or without pocket, accounting control sheets, multiple sets, airline tickets (as single tickets or multiple sets), tickets with bar-codes, bills of lading, booking confirmation, travel information, boarding cards, reservation cards, luggage tags and the like, all of which can appear as a single sheet or in continuous form. Incorrectly running printing material can be removed from the printer, and, furthermore, the openings of the individual paper channels can be reached.

A common paper path is provided for single sheets, single documents and continuous sheet, but servicing and maintenance is facilitated as is operational work to be undertaken by service personnel, such as for example the replacement of the ink ribbon cassette, the removal of paper remains and the like.

A particular advantage lies in the fact that the input of all types of documents and the output of same can take place at one and the same side of the printer.

The upper housing section and the upper roller(s) are both secured to the base section but are adjustable as to their relative position thereto and therefore also to the lower roller(s). The upper section may be pivotally connected to the base section at one end thereof. It can, therefore, be opened, or folded, out from the base section.

Preferably the upper roller(s) are pivoted on an arm which can swivel about a horizontally extending axis at the same end of the base section as the pivot connection of the opening-out upper housing section. Thus there are respectively angular shaped access areas on the one hand between the opening-out housing section and the arm bearing the upper rollers, and on the other hand, between the arm and the base section.

The upper rollers are secured to the lower rollers by either engaging therewith or being biased by a spring theretowards when the upper housing section is lowered.

An individual assembly framework may be provided for

securing a scanner device, a printing mechanism with printing head, an ink ribbon cassette, a cutting mechanism and a printing material output channel. This arrangement facilitates construction and increases accessibility for the user, because the running of the ink ribbon past the printing elements can be clearly observed. Furthermore, it is advantageous in that free access to the lower base section is made possible through raising the housing section, likewise raising the pivotable arm with the upper rollers.

Whilst with known devices in general the electronic circuits are arranged in the lower base section, it is suggested that a control plate be provided at one end of the housing section. Through this the smallest possible connection to the electronic assembly which is found in the vicinity can be achieved. In addition, a very high degree of integration is achieved between the mechanical and the electrical base structures.

The motors for the lower roller(s) and for the magnetic strip identification device, likewise the energy supply, are arranged within the lower base section as individual modules.

A clamping band may be mounted in the lower base section, having a flat print support surface facing the printing head. Space is available for that purpose at the required distance from other basic structures, so as to allow coordination of the individual basic structures when the apparatus is closed.

The general usefulness with paper supplied both manually and by a motor-drive is improved by the fact that a protective chute with its own pair of travel rollers is preferably arranged directly against the upper housing part, in the lowered position thereof, which links up with the lower base section.

A further improvement lies in providing a paper input device for continuous printing material in the lower base section below the protective chute. Through this,

seen from the service side, a uniform supply side is created for the paper.

Suitably document storage bins are attached for the processing of single sheets and/or continuous printing material at the beginning of a processing plane, which open out into at least one entrance for motor-supplied continuous printing material and an entrance for motor-supplied single sheets. A horizontal entrance for single sheets or an upper entrance for manually or automatically supplied single sheets is provided. Material travel takes place along a single processing plane and in one direction, the printing material being re-routed into a counter travel direction at the end of the processing plane. The printing material can be distributed in the service area.

A printing mechanism, a scanner device, a bar-code reader and a cutting mechanism are arranged over the processing plane, and a magnetic strip identification device and a two track bar-code reader are arranged below the processing plane. Therefore all module structures are easy to operate, despite their use to print difficultly differing designed types of documents. Service personnel can quickly intercede if there is a breakdown to remove the trouble since they can open out the printer.

The invention will now be further described with reference to the accompanying drawings:-

Figure 1 is a perpendicular cross-section through a printer with a document storage container;

Figure 2 is a longitudinal section through the printer of Figure 1 when closed-up;

Figure 3 is a longitudinal section through the printer of Figure 1 when opened out, and

Figure 4 is a section from Figures 2 and 3 in an enlarged scale.

The printer possesses a framework within a housing, to which assemblies are secured. The printing material 1

may be comprised of, for example, single tickets, public transport tickets, travel bills, travellers cheques with and without pockets, account control sheets, multiple sets, airline tickets (single tickets or multiple sets), tickets with bar-codes, bills of lading, booking confirmations, travel information, boarding cards, reservation tickets, luggage tags, and all the above-mentioned items in continuous form.

In principle the printing material 1 is fed in from the front as a single sheet from above and as a continuous sheet from below, and in every case, travels through the printer and is then ejected in the counter-travel direction.

The printer comprises a lower base section 3 and a housing section 4 which can be opened-out.

The lower base section 3 has, in travel direction 5, a first motor 7 with a first driven, travel roller 9 and an undriven travel roller 8 for continuous sheet travel 6. Continuous printing material 10 is fed into a paper input device 11 the base section 3 having a corresponding opening.

A second motor 12 with a pair of travel rollers 13, transports individual documents or a continuous sheet 14 into a common paper channel 15. In addition a protective chute 16 having a pair of travel rollers 17 is attached to the base section.

In the base section 3 in the inner area, there is found consecutively in the direction of travel 5, a magnetic strip identification device 18 with a third motor 19 (Figure 2), a fourth motor 20 for the driven lower rollers (21), a clamping bar 22 with a flat printing support surface 22a, a cutting device 23 (cutting edge), an energy supply device 24 and an area for a defect-ejection receptacle 25, which extends in the counter-travel direction. A third motor 19 is arranged in the lower base section 3 for the magnetic strip identification device 18 in a magnetic strip unit module.

The lower rollers 21 are respectively associated with the upper rollers 26. All upper rollers 26 can be raised as a unit, as is shown by a broken line in Figure 3. The upper roller unit 26 is either engaged with, or by spring force securely positioned relative to the lower roller unit 21 in the lower basic structure 3, i.e. to the lower rollers, by lowering housing section 4.

In this connection, all the upper rollers 26 which can be raised, are pivot-mounted on a swivelable arm 27. The arm 27 is swivel-mounted about a horizontal axis 29 at the same end 28 as the housing section 4 which can be opened out. Arm 27 is formed from a thinly curved sheet part 27a, on which, through curving (bending), the pivot bearings are formed.

In the housing section 4 (Figure 3) there is an individual assembly framework 30 for securing a scanner device 31, a printing mechanism 32 with a printing head 33, an ink ribbon cassette 34 and a cutting mechanism 35 (with a cutting roller) likewise a printing material ejection channel 36 as an extension of the defect-ejection receptacle 25. In addition, in the housing section 4 which can be opened-out, there is a control plate 38 at one end 37. The control plate 38 can be supplied with current by the energy supply device 24.

Ink ribbon cassette 34 has ink ribbon guides "A" to guide the ink ribbon in front of the printing head 33. On insertion of a new ink ribbon cassette, the ink ribbon is very easily accessible, insertable and can be readily manipulated.

Further, an upper bar-code reader 44 is provided above the processing plane 58.

In addition, at end 37 of the housing wall 79 of housing section 4, there is a fifth motor 39 for driving the printing head 33, which can be moved transversely in a guide 40. Additionally a paper guide 41 is provided with pairs of rollers 42 and 43, one of which is driven. The paper guide 41 extends upwards, turning back in the

counter-travel direction 2 when housing section 4 is closed up.

Protective chute 16 has a self-contained driven pair of travel rollers 17, whose driven can be derived from motor 12. The paper feed device 11 for the continuous printing material 10 is arranged below the protective chute.

The processing sequence of the printing material is uniform in the direction of travel 5. Ejected printing material is deposited, in the counter direction of travel 2, onto the upper surface 45 of the printer 71 and is, therefore, easily accessible.

The magnetic strip identification 18 is comprised in the main of a drive motor 46 for a sliding carriage 47 with guides 47a. On sliding carriage 47, there is a write-read-head 49 mounted by means of springs 48, which moves to and fro with the sliding carriage 47. The paper to be loaded is thereby pressed against a fixed stiffening piece 50.

A plurality of material storage containers 72, 73 and 74 are arranged below the printer 71 (Figure 1). In storage container 72, for example, individual documents 75 (airline tickets, train tickets amongst others) are stored, and in document storage containers 73, 74, continuous sheets 14 are stored. Each of the document storage containers 72 and 74 has a separating or travel device 77. Printer 71 together with document storage containers 72 and 74 is constructed either as a free-standing apparatus or (as shown) a table apparatus on a stand 78. The document storage containers 72 to 74, together with the individuality of the document material determine the travel routes as does the formation of the printer itself.

With a plurality of types of documents, e.g. single tickets, public transport tickets, travel invoices, travellers cheques with or without pockets, accounting control sheets, multiple sets, airline tickets as single tickets or multiple sets, tickets with bar codes, bills of lading, boarding cards, reservation cards, luggage tags,

the specific ergonomic handling operations of the service personnel have to be taken into consideration.

Basically the document material is either supplied by motor from below, or from above by hand.

Continuous sheets 14 are fed from containers 73, 74 by a continuous sheet travel device 80 into a paper input 81, the base section 3 having a corresponding opening. The second motor 12 transports single documents 75 or the continuous sheet 14 via the pair of travel rollers 17 into the common paper channel 15.

At the beginning 57 of the processing plane 58 there is at least one input for motor supplied continuous sheets 14. A further input 59a can be provided for both continuous sheets 14 and also for motor supplied single sheets or documents 75, all the inputs discharging into the beginning 57. A horizontal input 60 is formed for single documents 75 and an upper side input 61 for manually supplied single documents 75. All of the kinds of documents travel in a single processing plan 58 and in a single direction of travel 5.

At the end 62 of the processing plane 58, the document material is turned back in the counter direction of travel 2, and thereafter is deposited in a service area 63. In combination, the housing section 4 can be opened out, and where a plurality of processing stations can be raised together with the hinged housing wall 79.

All of the document storage containers 72 to 74 are connected to suitable supply channels 65 (Figure 1) at entrance 59a, and if necessary, provided with deflectors. Secured above the processing plane 58 is the printing mechanism 32, the scanning device 31, the upper bar-code-reader 44 on the printing mechanism 32, and the cutting mechanism 35 in the part 79 which can be opened out. Below the processing plane 58 there is the magnetic strip identification device 18 and the lower two-track-bar-code-reader B (reverse side document reader).

CLAIMS

1. A printer comprising an assembly arranged within a housing on a framework which comprises paper input and output channels formed by pairs of rollers and one or more processing stations including at least a printing station, the housing comprising a base section and an upper housing section moveable relative the base section to open out the housing wherein the upper housing section and an at least one upper roller associated with a lower roller positioned in the base section are capable of being independently raised.
2. A printer as claimed in Claim 1, wherein the upper housing section is raised by pivoting thereof about a connection between the upper housing section and the base section at one end thereof.
3. A printer as claimed in Claim 2, wherein the upper rollers(s) is mounted on an arm which is pivotal relative the base section about a horizontally extending axis, at the same end thereof as the pivot connection of the upper housing section.
4. A printer as claimed in any preceding Claim, wherein the upper housing section contains at least one processing station which, on raising of the upper housing section, rises with it.
5. A printer as claimed in any preceding Claim, wherein an individual assembly framework is provided in the upper housing section for securing a scanner device, a printing mechanism with a printing head, an ink ribbon cassette and a cutting mechanism, and a printing material ejection channel.
6. A printer as claimed in any preceding Claim, wherein a control plate is provided at one end in the upper

housing section.

7. A printer as claimed in any preceding Claim, wherein a processing station comprising a magnetic strip identification device is provided and wherein motors for the lower roller(s) and for the magnetic strip identification device, and an energy supply are arranged within the base section in individual modules.

8. A printer as claimed in any preceding Claim, wherein the printing station includes a printing head and wherein a clamping bar with flat print support surfaces turned towards the printing head, is mounted in the base section.

9. A printer as claimed in any preceding Claim, wherein a protective chute having a pair of travel rollers associated therewith is arranged directly against the upper housing section, in the lowered position thereof, and connects with the base section.

10. A printer as claimed in Claim 9, wherein a paper feed device for continuous printing material is arranged in the base section below the protective chute.

11. A printer as claimed in any preceding Claim, wherein printing material storage bins are provided at the beginning of a processing plane which connect to at least one entrance for motor-supplied continuous printing material and an entrance for motor-supplied single sheet printing material.

12. A printer as claimed in any preceding Claim, wherein either a horizontal entrance for single sheet printing material or an upper entrance for manually or automatically supplied single sheet printing material is provided.

13. A printer as claimed in any preceding Claim, wherein single sheet printing material and continuous printing material both travel along a single processing plane in one direction, the printing material being re-routed to a counter direction at the end of the processing plane, a printing mechanism and/or a scanner device and/or a bar-code reader and/or a cutting mechanism being arranged above the processing plane, and a magnetic strip identification device and/or a two-track-bar-code-reader being arranged below the processing plane.

14. A printer substantially as hereinbefore described and illustrated in the accompanying drawings.

Patents Act 1977**Examiner's report to the Comptroller under
Section 17 (The Search Report)**

Application number

GB 9221146.5

Relevant Technical fields

- (i) UK Cl (Edition 1)) B6F FKD FKE FKJ FKK FKL FKP
FKQ FKS FKW FAB FAL FNC
B8R RAX RRW12
- (ii) Int Cl (Edition 5)) B41J 013/00 01302 013/03
013/076 029/02

Search Examiner

F G MILES

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

6 FEBRUARY 1993

Documents considered relevant following a search in respect of claims 1

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

Category	Identity of document and relevant passages	Relevant to claim(s).

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

PUBLICATION NUMBER : 60105577
PUBLICATION DATE : 11-06-85

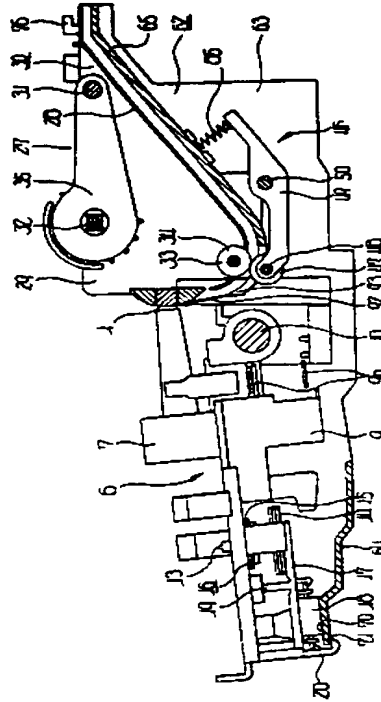
APPLICATION DATE : 15-11-83
APPLICATION NUMBER : 58214406

APPLICANT : TOKYO ELECTRIC CO LTD;

INVENTOR : NARUSHIMA TSUGIO;

INT.CL. : B41J 29/02 B41J 15/00

TITLE : PRINTER



ABSTRACT : PURPOSE: To permit simplification of assembling work by directly and detachably attaching a platen and a thin piece, which presses a recording paper against the platen, to the main frame which is integrally formed with side frames on both sides, a base and a paper guide.

CONSTITUTION: A main frame 62 made of die-cast aluminum is formed integrally with side frames 63 on both sides, a base 64 and a paper guide 65. At a bottom edge of this paper guide 65 a surface 93 is formed whereto a thin piece of Mylar sheet 92 is to be adhered. The Mylar sheet 92 presses against platen 1 the paper inserted between the paper guide 65 and a paper guide surface 28. The platen 1 is screwed down to a supporting member which is integrally formed with side frames 63 and has long holes on both ends. Thus, the number of components of the main frame is reduced and without using other supporting members a platen and a thin piece can be directly and detachably attached to the main frame, resulting in simplification of assembly.

COPYRIGHT: (C)1985,JPO&Japio

THIS PAGE BLANK (USPTO)